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THE GPS TRANSMIT ANTENNA PHASE CENTER AND ITS IMPACT ON PRECISE GEOPHYSICAL APPLICATIONS

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The ionospheric-free (Lc) phase center of the GPS transmit antenna is modeled as a fixed constant in most geodetic software packages. We estimated a phase center offset for all GPS satellites and found large deviations from the nominal values. In particular, meter level deviation was observed for PRN 13 and somewhat smaller anomalies were observed for PRNs 6, 15, 19 and 31. We will present the estimation results for all GPS satellites and describe the estimation process as well as an error budget. We will present evidence that estimating the phase center offset improves the GPS orbits and discuss the impact of phase center mismodeling on various high-precision applications.

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